



**FCC 47 CFR PART 15 Subpart C**

**TEST REPORT**

**For**

**2.4G Blue Trace mouse**

**Model GKC; GKB; GKS; GKD; GKT; GKQ; GM3**

**Trade Name: ACROX**

Issued to

**Acrox Technologies Co., Ltd.**

**4F., No. 89, Minshan St., Neihu Dist., Taipei City 114, Taiwan, R.O.C.**

Issued by

**Compliance Certification Services Inc.**

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**Revision History**

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	August 23, 2010	Initial Issue	ALL	Celine Chou



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# 1. TEST RESULT CERTIFICATION

**Applicant:** Acrox Technologies Co., Ltd.  
 4F., No.89, Minshan St., Neihu Dist., Taipei City 114,  
 Taiwan, R.O.C.

**Equipment Under Test:** 2.4G Blue Trace mouse

**Trade Name:** ACROX

**Model:** GKC; GKB; GKS; GKD; GKT; GKQ; GM3

**Date of Test:** August 19 ~20, 2010

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

### We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements emission limits of FCC Rules Part 15.207, 15.209 and 15.249. The test results of this report relate only to the tested sample identified in this report.

**Approved by:**

**Reviewed by:**

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Stan Lin  
Supervisor

---

Alonso Lu  
Engineer



## 2. EUT DESCRIPTION

<b>Product</b>	2.4G Blue Trace mouse
<b>Model</b>	GKC; GKB; GKS; GKD; GKT; GKQ; GM3
<b>Brand</b>	ACROX
<b>Model Discrepancy</b>	1. All the model numbers are identical just for marketing purpose only 2. Client consigns only one sample to test (model number: GKC). Therefore, the testing Lab. just guarantees the unit, which has been tested.
<b>EUT Power Rating</b>	3VDC from Battery
<b>Operating Frequency Range</b>	2402 ~ 2480MHz
<b>Output Power</b>	93.44dBuV/m
<b>Modulation Technique</b>	GFSK
<b>Number of Channels</b>	79 Channels
<b>Antenna Gain</b>	-5.91dBi
<b>Antenna Designation</b>	PCB Antenna

**Remark:**

1. The sample selected for test was production product and was provided by manufacturer.
2. This test report is intended for FCC ID: **PRDOPWIRWMU21** to comply with Section 15.207, 15.209, 15.249 (FCC Part 15, Subpart C Rules.)
3. The Nano dongle (in external photographs) is a receiver only.



### **3. TEST METHODOLOGY**

The tests documented in this report were performed in accordance with ANSI C63.4 (2003) and FCC CFR 47 Part 2, Part 15.207, 15.209 and 15.249.

#### **3.1 EUT CONFIGURATION**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### **3.2 EUT EXERCISE**

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209, 15.249 under the FCC Rules Part 15 Subpart C.

#### **3.3 GENERAL TEST PROCEDURES**

##### **Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 (2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

##### **Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4 (2003).



### 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41	322 - 335.4		

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

### 3.5 DESCRIPTION OF TEST MODES

AMW47 had been tested under operating condition except radiated spurious emission below 1GHz and powerline conducted emission below 30MHz, which were in normal link mode only.

Channel Low (2403MHz), Channel Mid (2440MHz) and Channel High (2480MHz) were chosen for the final testing.



## 4. INSTRUMENT CALIBRATION

### 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 4.2 MEASUREMENT EQUIPMENT USED

#### Equipment Used for Emissions Measurement

**Remark:** Each piece of equipment is scheduled for calibration once a year.

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY48250064	10/28/2010
Pre-Amplifier	HP	8449B	3008A00965	12/31/2010
Pre-Amplifier	MITEQ	AMF-6F-26040 0-40-8P	985646	05/24/2011
Horn Antenna	EMCO	3115	9602-4659	04/16/2011
Horn Antenna	EMCO	3116	00026370	10/15/2010
Low Loss Cable	Huber+Suhner	104PEA	24813/4PEA	04/17/2011
Low Loss Cable	Huber+Suhner	104PEA	30956/4PEA	04/17/2011
Site VSWR	SIDT EUROPE	9x6x6	N/A	02/27/2011
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Test S/W	CCS-3A1RE			

### 4.3 MEASUREMENT UNCERTAINTY

Parameter	Uncertainty
Powerline Conducted Emission	N/A
3M Semi Anechoic Chamber / 30MHz ~ 1GHz	±4.0474
3M Semi Anechoic Chamber / Above 1GHz	±3.8967

**Remark:** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.





## **5. FACILITIES AND ACCREDITATIONS**

### **5.1 FACILITIES**

All measurement facilities used to collect the measurement data are located at

- No. 199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.  
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029
  
- No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan  
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045
  
- No. 81-1, Lane 210, Pa-De 2nd Rd., Luchu Hsiang, Taoyuan Shien, (338) Taiwan, R.O.C.  
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7 (1992), ANSI C63.4 (2003) and CISPR Publication 22.

### **5.2 EQUIPMENT**

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



**5.3 TABLE OF ACCREDITATIONS AND LISTINGS**

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	CFR 47, FCC Part15/18, CISPR 22, EN 55022, ICES-003, AS/NZS CISPR 22, VCCI V-3, EN 55011, CISPR 11, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 61000-6-1/2/3/4, EN 55024, CISPR 24, AS/NZS CISPR 24, AS/NZS 61000.6.2, EN 55014-1/-2, ETSI EN 300 386 v1.3.2/v1.3.3, IEC/EN 61000-3-2, AS/NZS 61000.3.2, IEC/EN 61000-3-3, AS/NZS 61000.3.3	
USA	FCC MRA	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	
Japan	VCCI	3/10 meter Open Area Test Sites and conducted test sites to perform radiated/conducted measurements	
Taiwan	TAF	EN 55014-1, CISPR 14, CNS 13781-1, EN 55013, CISPR 13, CNS 13439, EN 55011, CISPR 11, CNS 13803, PLMN09, IS2045-0, LP0002 FCC Part 27/90, Part 15B/C/D/E, RSS-192/193/210/310 ETSI EN 300 328/ 300 220-1/ 300 220-2/ 301 893/ 301 489-01/ 301 489-03/ 301 489-07 / 301 489-17/ 300 440-1/ 300 440-2 AS/NZS 4268, AS/NZS 4771 CISPR 22, EN 55022, CNS 13438, AS/NZS CISPR 22, VCCI, IEC/EN 61000-4-2/3/4/5/6/8/11, CNS 14676-2/3/4/5/6/8, CNS 14934-2/3, CNS 13783-1, CNS 13439, CNS 13803	
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	SL2-IS-E-0014 / IN-E-0014 /A1-E-0014 /R1-E-0014 /R2-E-0014 /L1-E-0014
Canada	Industry Canada	RSS212, Issue 1	

**Note:** No part of this report may be used to claim or imply product endorsement by A2LA, TAF or other government agency.



## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### 6.2 SUPPORT EQUIPMENT

#### Below 1GHz

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Notebook PC	DELL	D400	0932RY	E2K24GBRL	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2.	LCD Monitor	DELL	2407WFPb	CN-0FC255-46633-675-25THS	FCC DoC	D-SUB Cable: Shielded, 1.8m with two cores	Unshielded, 1.8m
3.	Printer	EPSON	STYLUS C60	DR3K042012	FCC DoC	Shielded, 1.8m	Unshielded, 1.8m
4.	Dongle	N/A	N/A	N/A	FCC DoC	N/A	N/A

#### Above 1GHz

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
	N/A						

***\*\*No any support equipment during the test.***

**Remark:** Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



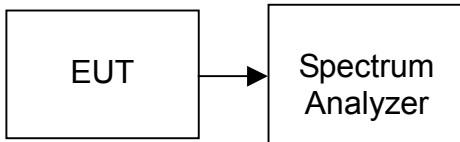
## **7. FCC PART 15.249 REQUIREMENTS**

### **7.1 20dB BANDWIDTH**

#### **LIMIT**

None; for reporting purposes only.

#### **TEST CONFIGURATION**



#### **TEST PROCEDURE**

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100kHz, VBW = 300kHz, Span = 3MHz, Sweep = auto.
4. Mark the peak frequency and 20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

#### **TEST RESULTS**

*No non-compliance noted*



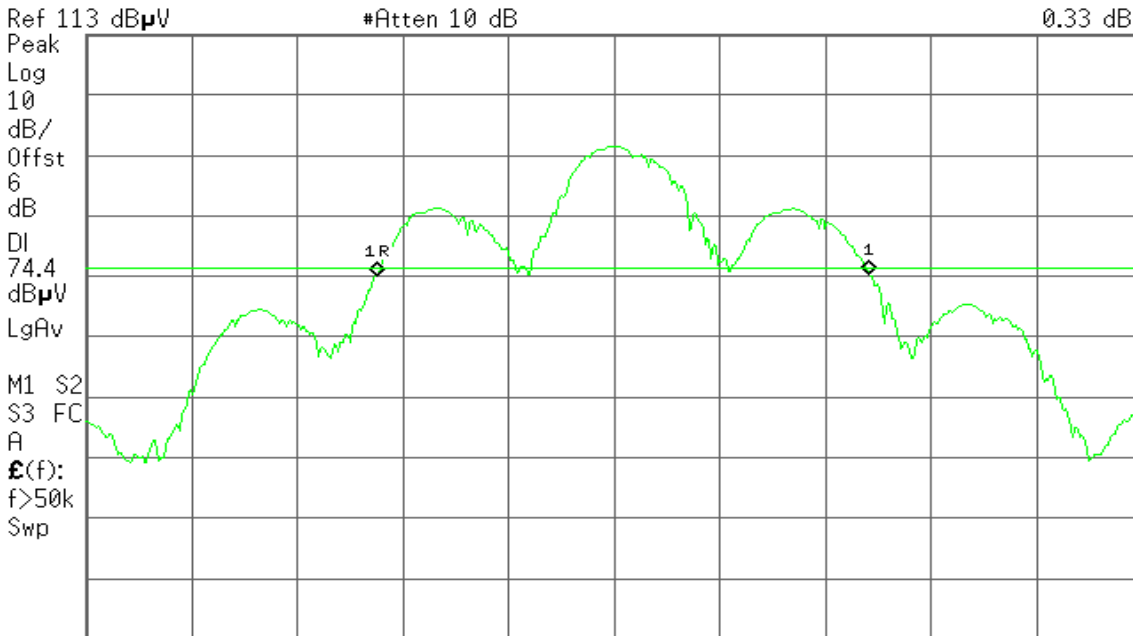
### TEST PLOT

#### 20dB Bandwidth (CH Low)

Agilent 11:15:02 Aug 20, 2010

R T

Mkr1 1.400 MHz  
0.33 dB

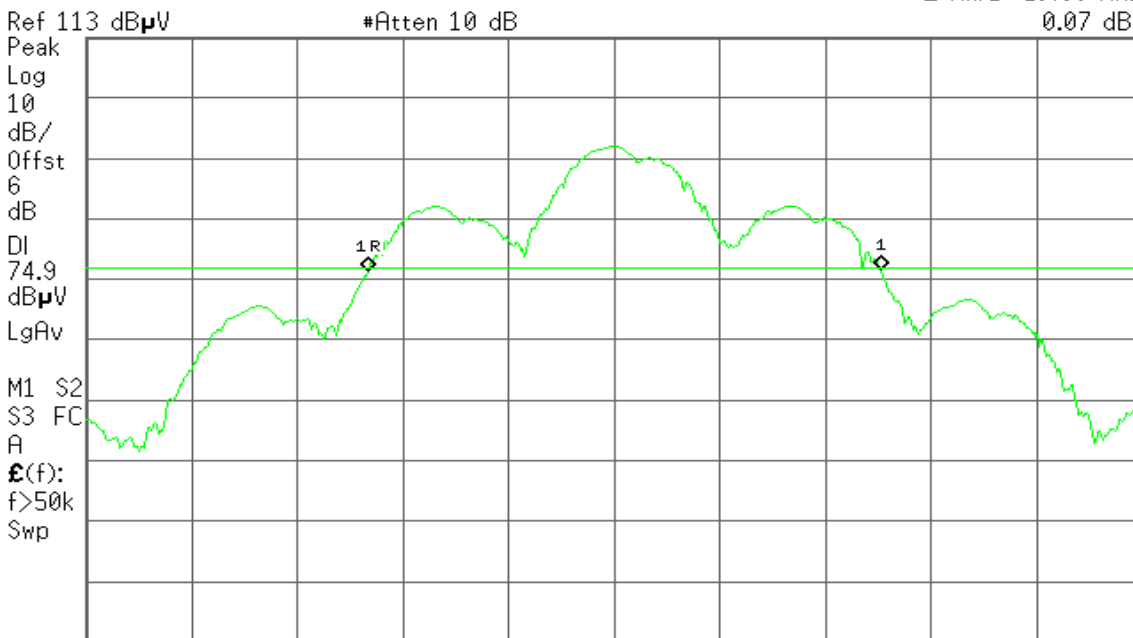


#### 20dB Bandwidth (CH Mid)

Agilent 11:19:35 Aug 20, 2010

R T

Mkr1 1.460 MHz  
0.07 dB



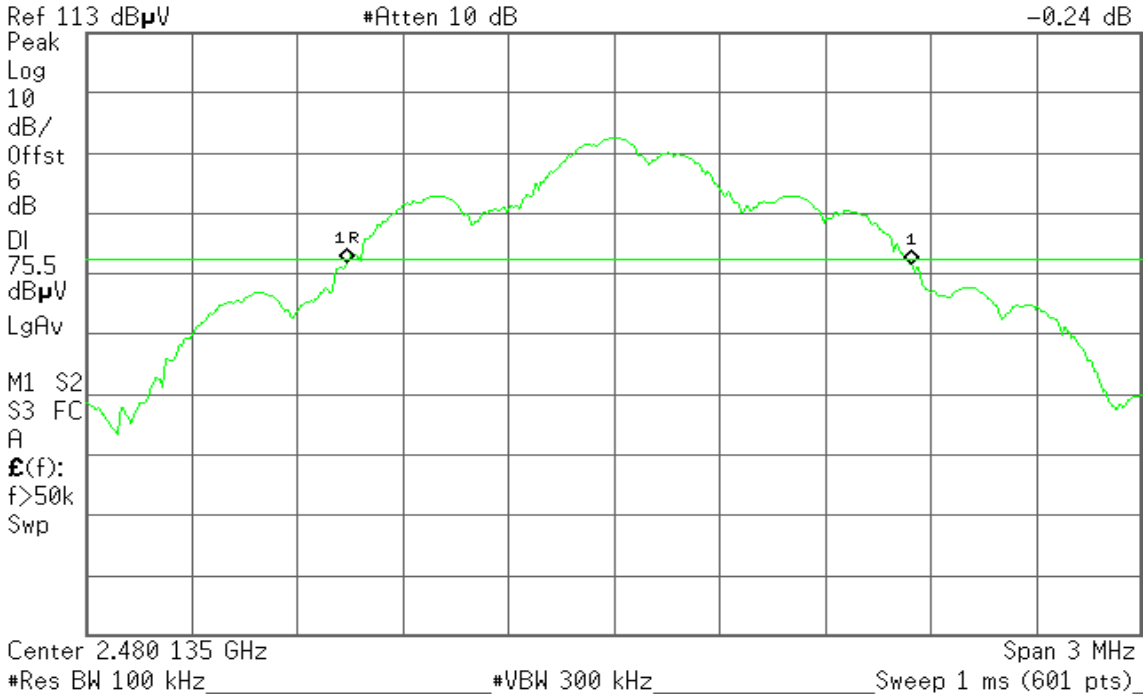


### 20dB Bandwidth (CH High)

Agilent 11:26:57 Aug 20, 2010

R T

Mkr1 1.605 MHz  
-0.24 dB





## 7.2 BAND EDGES MEASUREMENT

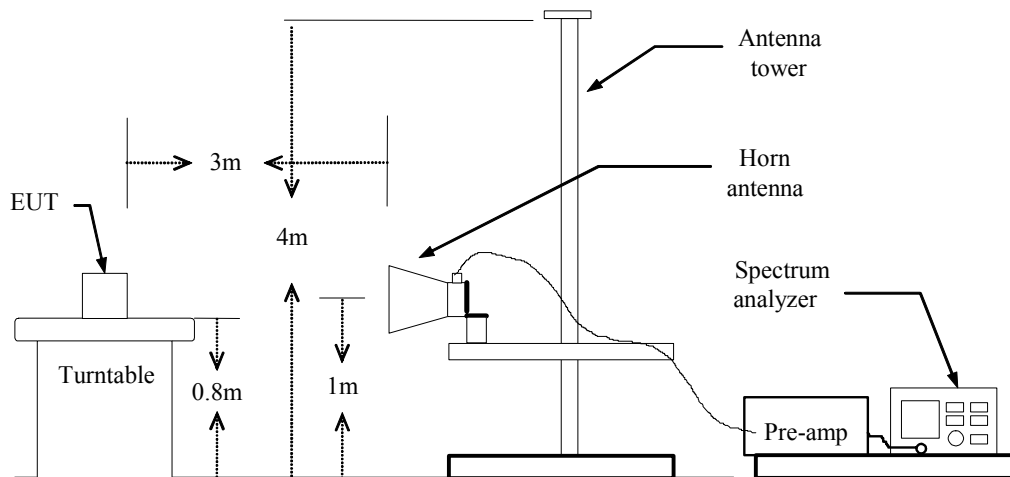
### LIMIT

1. In the above emission table, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength ( $\mu\text{V}/\text{m}$ at 3-meter)	Field Strength ( $\text{dB}\mu\text{V}/\text{m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

2. As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

### TEST CONFIGURATION



### TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
  - (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
  - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

### TEST RESULTS

Refer to attach spectrum analyzer data chart.



TEST PLOT

Band Edges (CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent 11:07:37 Aug 20, 2010

R T

Mkr1 2.403 26 GHz 75.70 dBµV



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.403 26 GHz	75.70 dBµU
2	(1)	Freq	2.390 00 GHz	49.51 dBµU

#Res BW 1 MHz #VBW 1 MHz #Sweep 100 ms (601 pts)

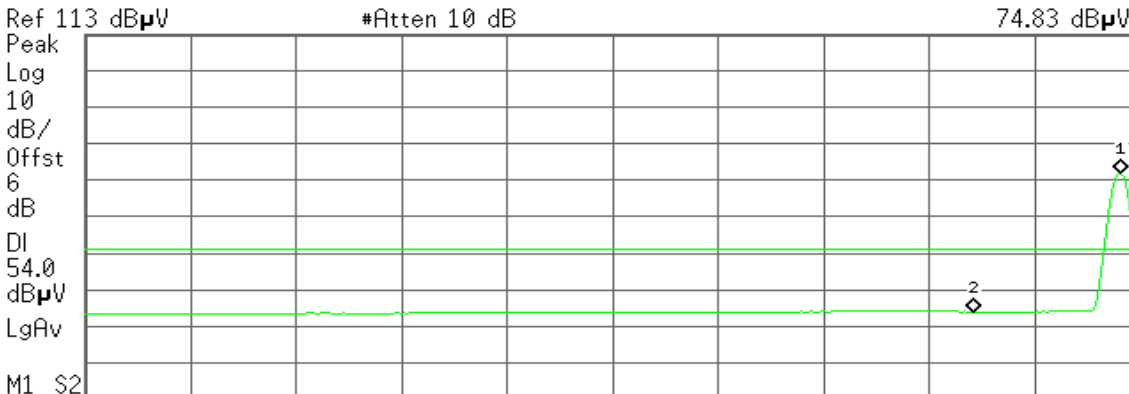
Detector mode: Average

Polarity: Vertical

Agilent 11:08:03 Aug 20, 2010

R T

Mkr1 2.403 26 GHz 74.83 dBµV



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.403 26 GHz	74.83 dBµU
2	(1)	Freq	2.390 00 GHz	36.96 dBµU

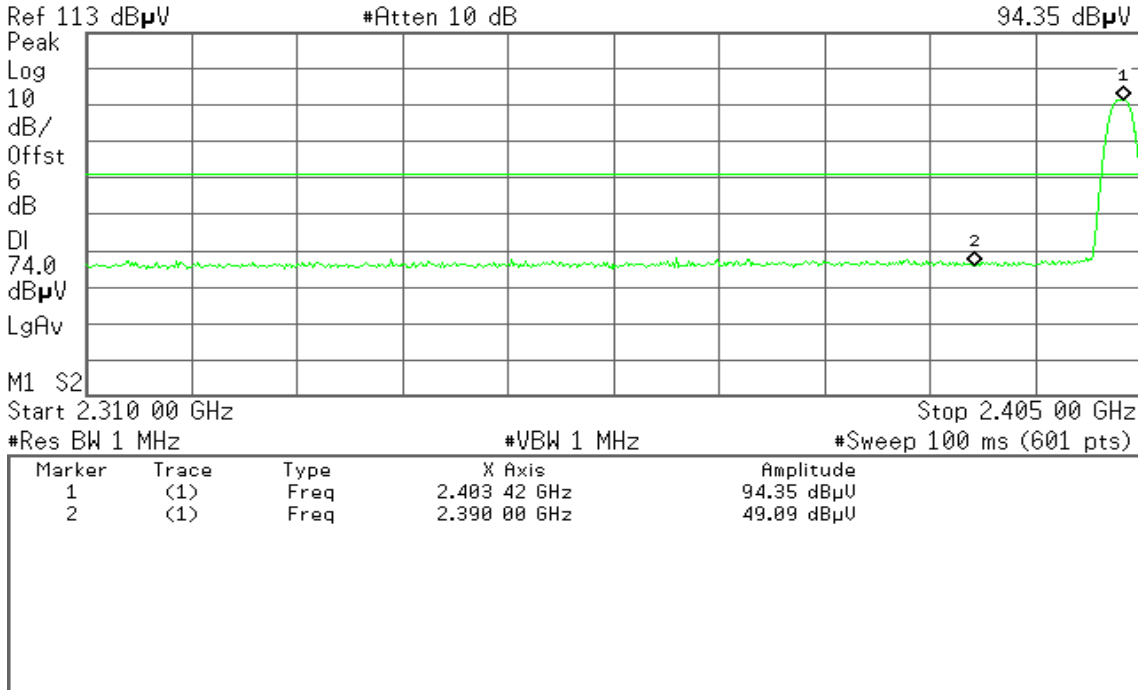
#Res BW 1 MHz #VBW 10 Hz Sweep 7.408 s (601 pts)



**Detector mode: Peak****Polarity: Horizontal**

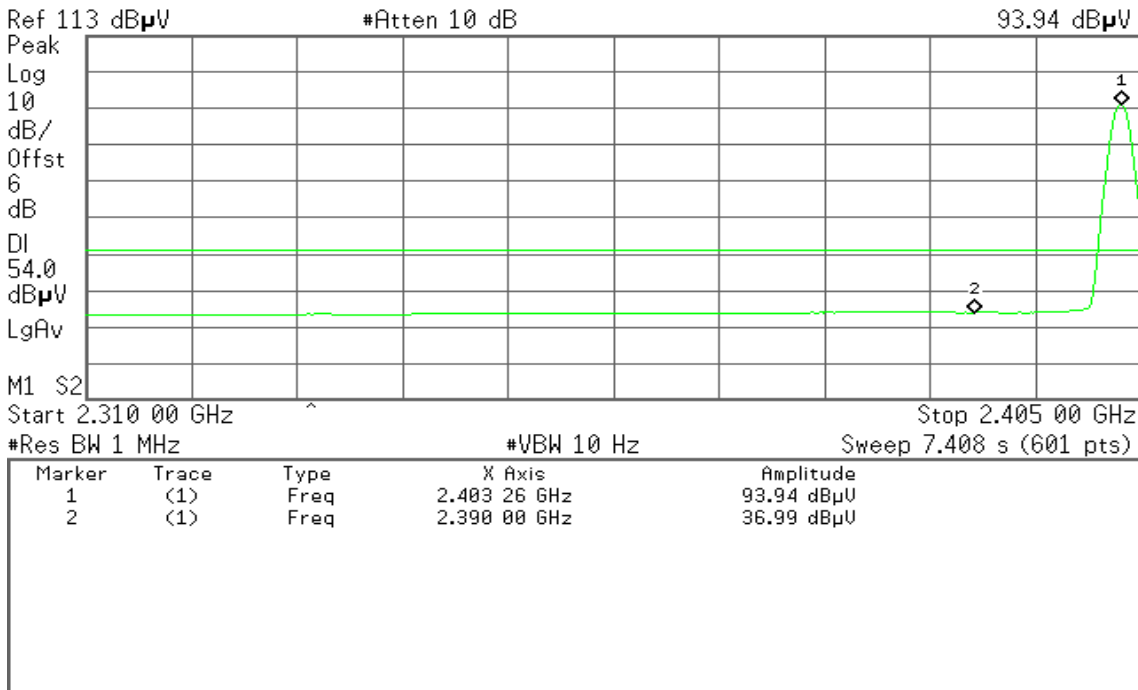
\* Agilent 11:05:00 Aug 20, 2010

R T

Mkr1 2.403 42 GHz  
94.35 dB $\mu$ V**Detector mode: Average****Polarity: Horizontal**

\* Agilent 11:05:28 Aug 20, 2010

R T

Mkr1 2.403 26 GHz  
93.94 dB $\mu$ V

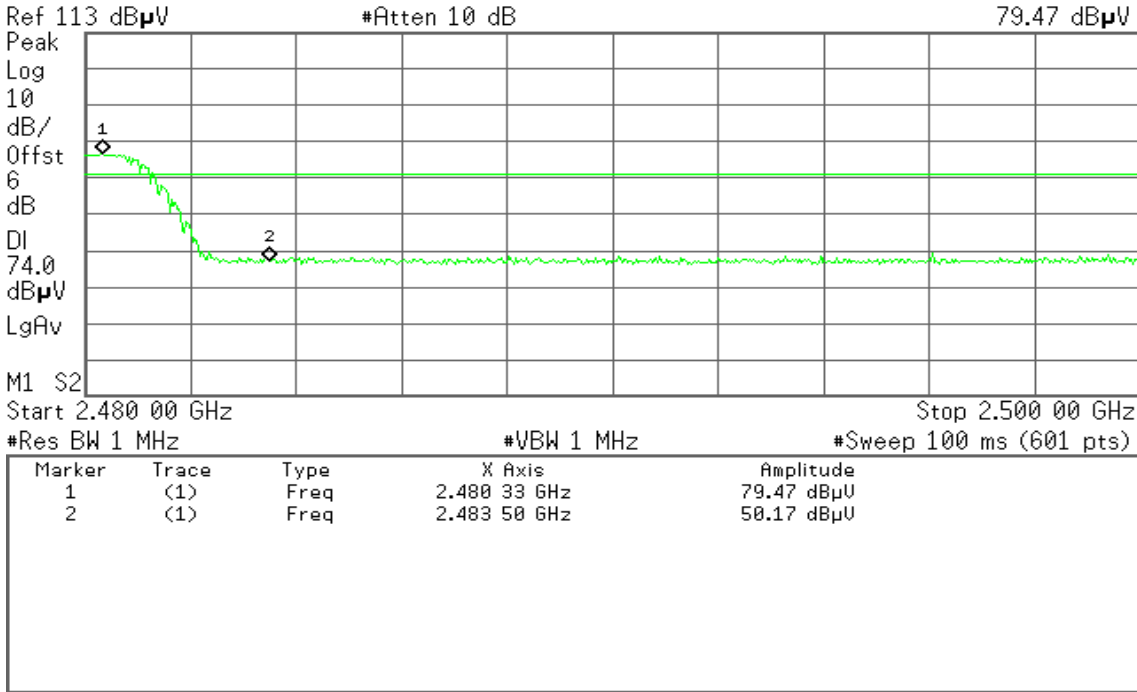


## Band Edges (CH High)

**Detector mode: Peak****Polarity: Vertical**

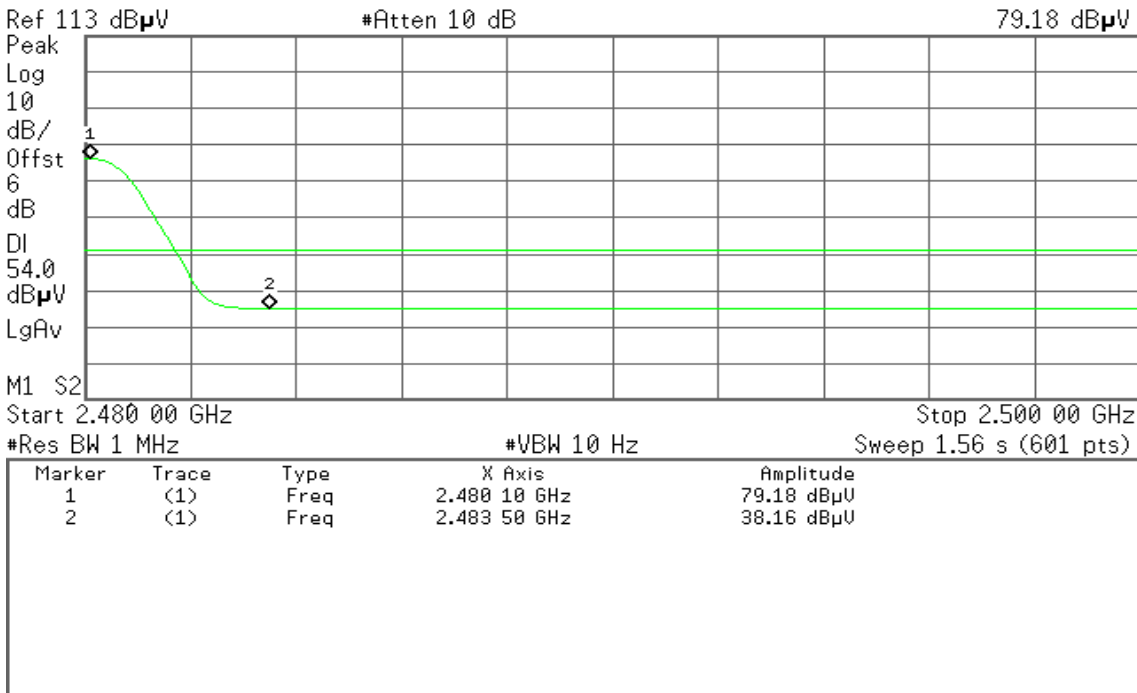
\* Agilent 11:00:44 Aug 20, 2010

R T

Mkr1 2.480 33 GHz  
79.47 dB $\mu$ V**Detector mode: Average****Polarity: Vertical**

\* Agilent 11:00:13 Aug 20, 2010

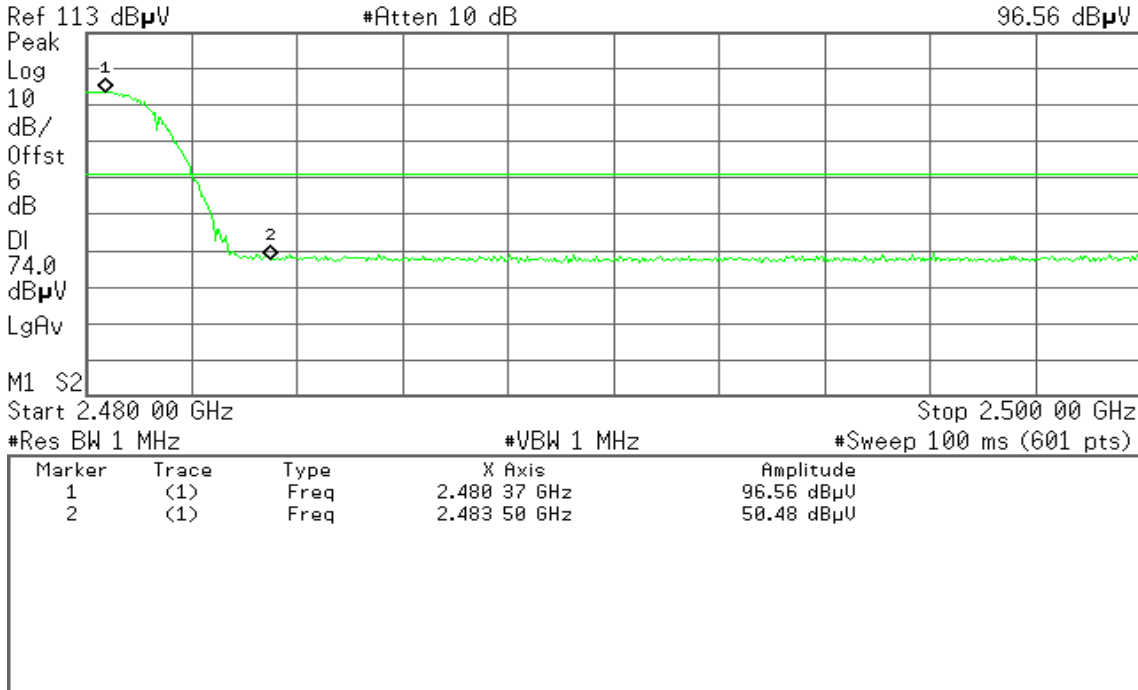
R T

Mkr1 2.480 10 GHz  
79.18 dB $\mu$ V

**Detector mode: Peak****Polarity: Horizontal**

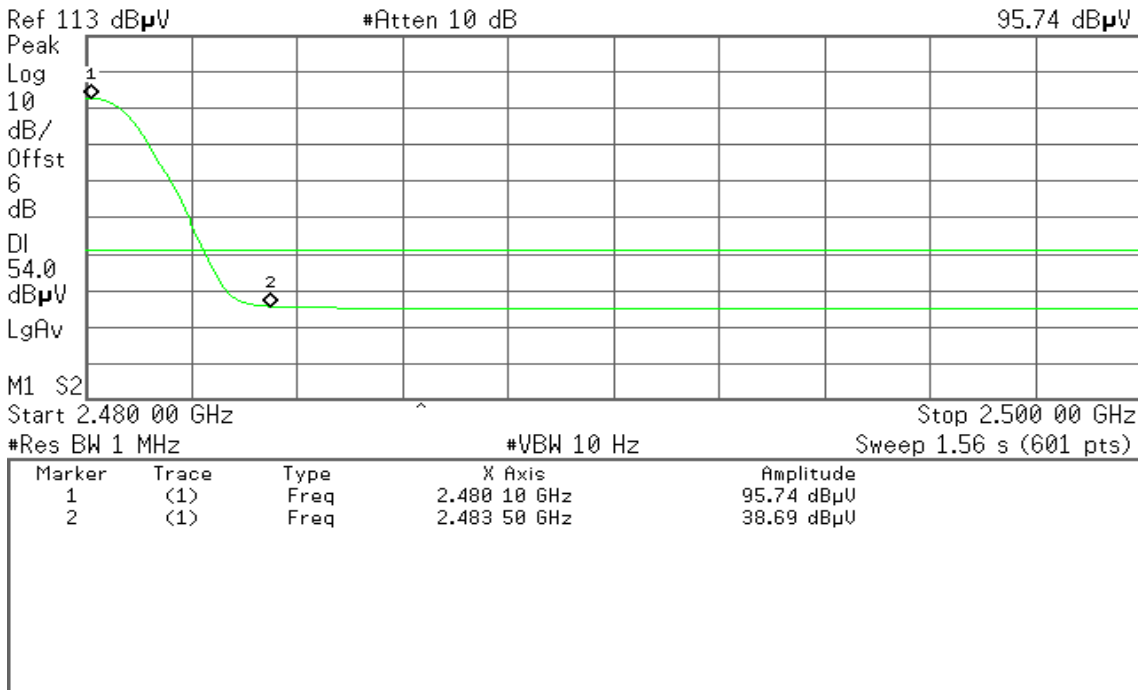
\* Agilent 11:02:21 Aug 20, 2010

R T

Mkr1 2.480 37 GHz  
96.56 dB $\mu$ V**Detector mode: Average****Polarity: Horizontal**

\* Agilent 11:03:01 Aug 20, 2010

R T

Mkr1 2.480 10 GHz  
95.74 dB $\mu$ V



### 7.3 SPURIOUS EMISSION

#### LIMIT

1. In the section 15.249(a):

Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental Field Strength (mV/m)	Field Strength of Harmonics (µV/m)
902-928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

2. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

**Remark:** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

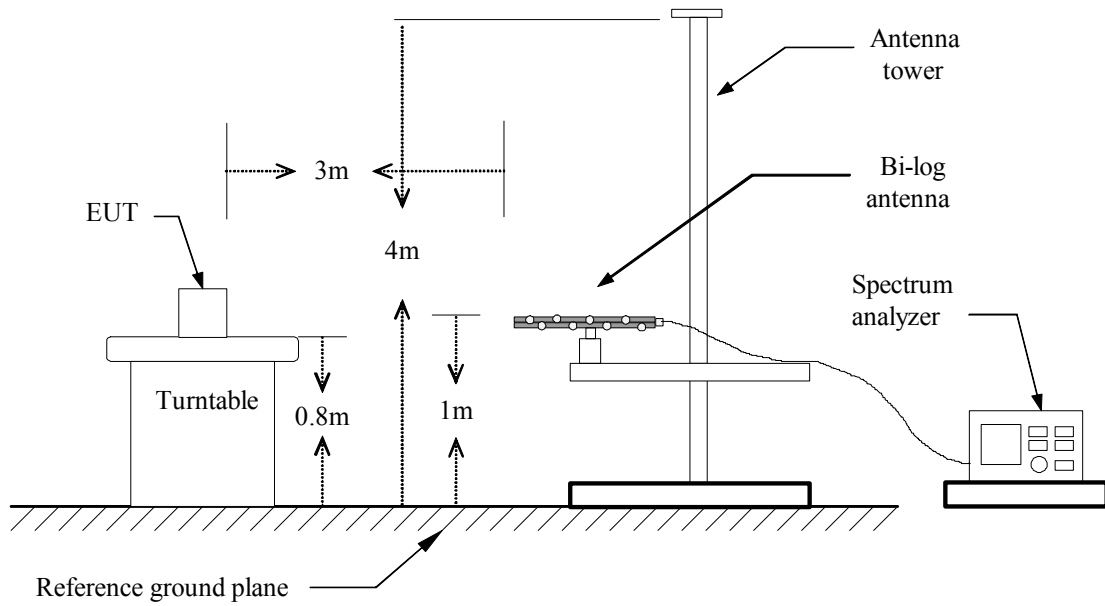
3. In the above emission table, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength (µV/m at 3-meter)	Field Strength (dBµV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

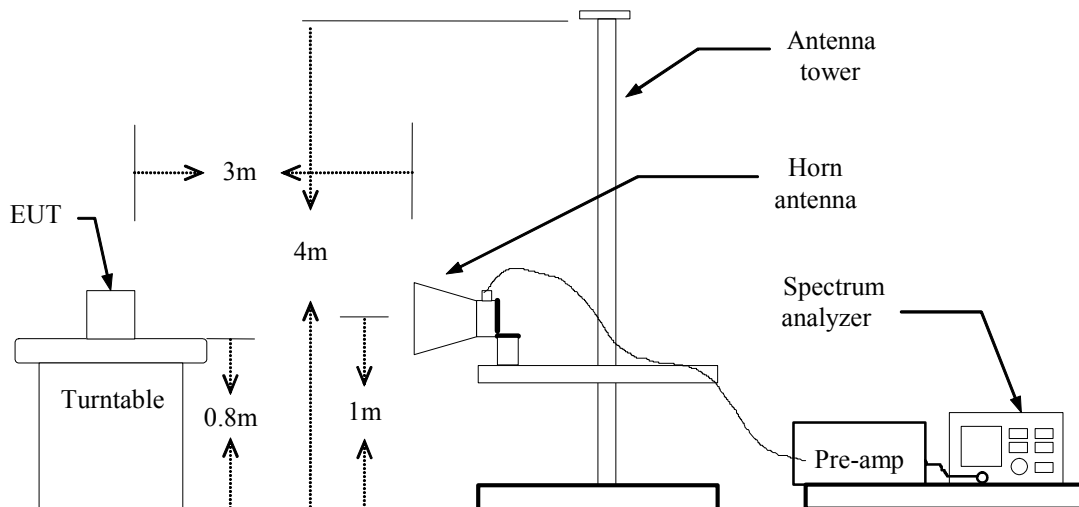


## TEST CONFIGURATION

### Below 1 GHz



### Above 1 GHz





## **TEST PROCEDURE**

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:  
Below 1GHz:  
    RBW=100kHz / VBW=300kHz / Sweep=AUTO  
Above 1GHz:  
    (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO  
    (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

## **TEST RESULTS**

*No non-compliance noted.*



**TEST DATA**

**Below 1 GHz**

**Operation Mode:** Normal Link      **Test Date:** August 20, 2010  
**Temperature:** 18°C      **Tested by:** Alonso Lu  
**Humidity:** 60% RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
31.9546	V	51.99	-14.81	37.18	40.00	-2.82	QP
62.9800	V	47.74	-16.41	31.33	40.00	-8.67	QP
76.5600	V	51.58	-19.16	32.42	40.00	-7.58	QP
148.3400	V	43.95	-12.55	31.40	43.50	-12.10	QP
198.7800	V	47.73	-15.36	32.37	43.50	-11.13	QP
322.9400	V	44.64	-10.46	34.18	46.00	-11.82	QP
450.9800	V	46.47	-8.26	38.21	46.00	-7.79	QP
499.4800	V	41.95	-7.08	34.87	46.00	-11.13	QP
565.4400	V	40.46	-5.52	34.94	46.00	-11.06	QP
903.0000	V	38.16	0.36	38.52	46.00	-7.48	QP
31.9546	H	46.21	-14.81	31.40	40.00	-8.60	QP
62.9800	H	41.98	-16.41	25.57	40.00	-14.43	QP
148.3400	H	39.93	-12.55	27.38	43.50	-16.12	QP
198.7800	H	49.76	-15.36	34.40	43.50	-9.10	QP
256.9800	H	44.49	-12.34	32.15	46.00	-13.85	QP
322.9400	H	44.06	-10.46	33.60	46.00	-12.40	QP
398.6000	H	44.06	-9.48	34.58	46.00	-11.42	QP
452.9200	H	41.65	-8.22	33.43	46.00	-12.57	QP
908.8200	H	37.25	0.50	37.75	46.00	-8.25	QP

**Remark:**

1. No emission found between lowest internal used / generated frequency to 30 MHz. (9kHz ~ 30MHz)
2. Measuring frequencies from 9 kHz to the 1GHz.
3. Radiated emissions measured in the measured frequency range were made with an instrument using Quasi-peak detector mode.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



## Above 1 GHz

**Operation Mode:** Tx / CH Low      **Test Date:** August 19, 2010

**Temperature:** 25°C      **Tested by:** Alonso Lu

**Humidity:** 60% RH      **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Result		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
2403.17	V	74.43	73.82	1.32	75.74	75.14	114.00	94.00	-18.86	AVG
1893.33	V	48.82	---	-0.91	47.91	---	74.00	54.00	-6.09	Peak
2263.33	V	47.91	---	0.57	48.48	---	74.00	54.00	-5.52	Peak
2540.00	V	48.22	---	1.93	50.15	---	74.00	54.00	-3.85	Peak
4808.33	V	40.39	---	6.25	46.64	---	74.00	54.00	-7.36	Peak
N/A										
2402.98	H	94.54	94.06	-1.54	93.00	92.52	114.00	94.00	-1.48	AVG
2080.00	H	49.48	---	-2.04	47.44	---	74.00	54.00	-6.56	Peak
2576.67	H	49.51	---	-0.18	49.33	---	74.00	54.00	-4.67	Peak
4808.33	H	43.81	---	7.73	51.55	---	74.00	54.00	-2.45	AVG
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" no emission measured remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.





**Operation Mode:** Tx / CH Mid                      **Test Date:** August 19, 2010  
**Temperature:** 25°C                                      **Tested by:** Alonso Lu  
**Humidity:** 60% RH                                      **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Result		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
2440.26	V	77.82	77.06	1.74	79.56	78.80	114.00	94.00	-15.20	AVG
1810.00	V	49.02	---	-0.97	48.05	---	74.00	54.00	-5.95	Peak
2213.33	V	48.90	---	0.75	49.65	---	74.00	54.00	-4.35	Peak
2503.33	V	47.62	---	2.39	50.00	---	74.00	54.00	-4.00	Peak
4883.33	V	40.98	---	7.44	48.42	---	74.00	54.00	-5.58	Peak
N/A										
2440.28	H	94.97	94.12	-1.53	93.44	92.59	114.00	94.00	-1.41	AVG
2090.00	H	48.64	---	-1.79	46.84	---	74.00	54.00	-7.16	Peak
2276.67	H	48.54	---	-1.53	47.01	---	74.00	54.00	-6.99	Peak
2620.00	H	48.23	---	0.08	48.31	---	74.00	54.00	-5.69	Peak
4883.33	H	45.54	43.77	7.75	53.29	51.52	74.00	54.00	-2.48	AVG
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" no emission measured remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** Tx / CH High      **Test Date:** August 19, 2010  
**Temperature:** 25°C      **Tested by:** Alonso Lu  
**Humidity:** 60% RH      **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Result		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
2480.06	V	77.16	76.43	2.20	79.36	78.63	114.00	94.00	-15.37	AVG
2200.00	V	48.64	---	0.80	49.44	---	74.00	54.00	-4.56	Peak
2563.33	V	49.49	---	1.63	51.12	---	74.00	54.00	-2.88	Peak
4958.33	V	42.18	---	6.96	49.14	---	74.00	54.00	-4.86	Peak
N/A										
2480.24	H	94.84	94.08	-1.52	93.32	92.56	114.00	94.00	-1.44	AVG
1650.00	H	50.64	---	-4.89	45.74	---	74.00	54.00	-8.26	Peak
2436.67	H	49.11	---	-1.53	47.58	---	74.00	54.00	-6.42	Peak
2593.33	H	48.12	---	0.11	48.23	---	74.00	54.00	-5.77	Peak
4958.33	H	47.30	44.40	8.75	56.06	53.15	74.00	54.00	-0.85	AVG
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" no emission measured remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



## 7.4 POWERLINE CONDUCTED EMISSIONS

### LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

\* Decreases with the logarithm of the frequency.

### TEST CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.



## **TEST RESULTS**

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

## **TEST DATA**

**Not applicable (Since the EUT is powered by battery)**